CLAIMS

1. A mechanical resonator comprising:

a vibration body performing a mechanical resonant vibration; and

an electrode located in a vicinity of the vibration body during resonant vibration and arranged curved to an amplitude direction of the resonant vibration.

2. A mechanical resonator according to claim 1, wherein the curved electrode has a same surface shape as a shape of the vibration body deformed in a resonance mode.

3. A mechanical resonator according to either claim 1 or claim 2, wherein the electrode surface opposed to the vibration body has an area smaller than a surface area of the vibration body.

4. A mechanical resonator according to claim 3, wherein the electrode is not arranged in an area opposed to a part of the vibration body assuming maximum in amplitude during resonant vibration and a vicinity thereof.

5. A mechanical resonator according to claim 3, wherein the electrode is not arranged in an area opposed to an end of the vibration body.

6. A mechanical resonator comprising:

a vibration body performing a mechanical resonant vibration; and

an electrode located in a vicinity of the vibration body

and vibrated in a resonance mode at a same resonant frequency.

7. A mechanical resonator according to any one of claims 1 to 6, further including a bias power source connected to the vibration body and the electrode and for generating an electrostatic field between those,

the vibration body resonantly vibrating when a voltage change at resonant frequency is provided to between the vibration body and the electrode.

8. A mechanical resonator according to any one of claims 1 to 6, further including a detecting section for detecting a signal from a voltage change of between the electrode and the vibration body,

wherein the detecting section detects a signal converted from a vibration into an electric signal, due to an electrostatic capacitance change at between the vibration body and the electrode during vibration of the vibration body.

9. A mechanical resonator according to any one of claims 1 to 8, wherein an insulation layer is provided in at least one of opposite surfaces of the electrode and the vibration body.

10. A mechanical resonator according to claim 9, wherein the insulation layer is made of a polymer particle having an insulation and lubricity.

11. A mechanical resonator according to any one of claims 1 to 5, further comprising a first contact electrode arranged

on a surface of the vibration body opposed to the electrode and isolated from the vibration body, and

a second electrode arranged isolated from the electrode in a manner of being fit with the first contact electrode.

12. A mechanical resonator according to claim 11, further including a bias power source connected to the vibration body and the electrode and for generating an electrostatic field between these,

the vibration body resonantly vibrating when a voltage change is provided to between the vibration body and the electrode, to be electrostatically absorbed by means of a voltage of the bias power source when the first contact electrode comes near the second contact electrode.

13. A mechanical resonator having a plurality of mechanical resonators according to either claim 7 or claim 8 electrically arranged in parallel.

14. A mechanical resonator having a plurality of mechanical resonators according to either claim 7 or claim 8 electrically arranged in series.

15. A mechanical resonator wherein a mechanical resonator according to any one of claims 1 to 14 is accommodated within a case sealing atmosphere at vacuum.

16. A filter using a mechanical resonator according to any one of claims 1 to 10.

17. A switch using a mechanical resonator according to

either claim 11 or claim 12.

18. An electric circuit using a mechanical resonator according to any one of claims 1 to 15.